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ROYAT

DR. G. H. BRANDT

151. o.
552.

GENERAL VIEW OF THE ESTABLISHMENT AND PARK AT ROYAT LES BAINS.

ROYAT

(LES BAINS)

IN AUVERGNE

ITS

MINERAL WATERS

AND

CLIMATE

BIBLIOTHECA
DEC 1880
BODLEIANA

BY

G. H. BRANDT M.D.

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PREFACE.

THE fact of my having visited, during the vacations of 1879 the interesting country of Auvergne, and taken an especial interest in its important health-resorts, more particularly *Royat les Bains*, Mont Dore, and La Bourboule: and having, moreover, published at that time some short appreciations of those places,* has procured me the honour of being solicited by Dr. Brandt to preface his small work on the waters and climate of Royat by a few words of comment.

I have little more to say than to commend his condensed and careful account of the neighbourhood, the climate, and the various mineral sources which Royat possesses, as well as his description of the cases which are likely to benefit by the course there as quite in accordance with my own experience and observations.

* "Some French Health Resorts" in "The Times" of Sept. 6th, and Oct. 6th, 1880.

I feel convinced that Royat les Bains is a station destined to much usefulness in connection with the treatment of those various forms of chronic gout—of chronic affections of the cutaneous and respiratory systems—to which Dr. Brandt calls attention in the following pages.

J. BURNEY YEO, M.D., F.R.C.P.

Hertford St., Mayfair.
May, 1880.

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ROYAT (LES BAINS) IN AUVERGNE.

INTRODUCTION.

On hearing the name of a new place mentioned as a health resort, the first questions are,—where is it? how do you get to it? and what is it good for? if it is well situated, of easy access, and if its waters and climate are of any real value. Many invalids may be tempted to try it, provided the information be satisfactory and correct.

As a rule, on looking through the numerous writings, and guide books on mineral springs, one finds that the list of ailments is so extensive, that it embraces almost all the diseases humanity is prone to. I know of nothing so damaging to a medicinal agent as to attribute to it the power of curing everything; it becomes a Panacea which sooner or later will fall into disuse, and its real virtues will be overlooked, or cast aside and abandoned.

My object is, therefore, to point out with as much impartiality as possible, what the waters of Royat are, and what they are capable of doing in suitable cases selected for treatment. I shall also dedicate a few pages to the climate, which I consider of paramount importance to invalids when selecting a summer residence for Balneo-Therapy, or for simple change of locality.

ROYAT.

The mineral springs of Royat are situated in the bed of a charming valley leading from Clermont-Ferrand to the Puy-de-Dome, at a height of 1480 feet above the level of the sea, and two miles distant from the chief town of the Puy-de-Dome Department, one of the principal stations on the Paris, Lyon, and Mediterranean railway line. The access is therefore easy, and it takes about nine hours from Paris. Anyone with a moderate knowledge of geology, will soon find that he is in the midst of extinct volcanoes, and surrounded by mineral waters which spring amidst those won-

derful eruptions: of all the departments of France the Puy-de-Dome certainly offers the most varied collection of volcanic remains. A very remarkable fact is, that we owe the first complete scientific description of this region to the pen of an English geologist, Poulett Scrope. This province was occupied for centuries by the Romans, who lived in a high state of civilization, as attested by the marvellous traces they have left behind them. Their knowledge and experience of mineral waters must have been great, if we can judge by the magnificent remains of their work, for we see scattered all over France, Spain, and Portugal wonderful marks of science, art, and industry, which even at the present time attract our attention, and command our admiration. Among all these remains of Roman work, that which interests the medical man, and claims his particular attention, are the establishments for mineral baths, which abound in this part of France, and which deserve a special study, owing to their peculiar virtues, and to the benefits they are daily affording to suffering humanity. My summer residence in this beautiful valley of Royat, enables me to

convey to my colleagues an idèa of this almost new place, and to describe the thermal springs, the establishment, the climate, and the cases which in my opinion are best suited for treatment.

ROYAT SPRINGS.

The four mineral springs at Royat, although of the same type—chloro-alcaline—differ as to their mineralisation, and their temperature: the presence of chloride of sodium and other salts show a marked difference from the frankly alcaline waters, of which we might quote as types, Vals and Vichy.

The salts of soda, potash, lime, and lithia, represent in these waters the alcaline elements, the depressing effects of which are counteracted by the tonifying properties of the salts of iron, and arsenic, which, combined with the stimulating effects of their carbonic acid, renders them so powerful and active.

The four springs bear the names of Eugénie, César, Saint Mart, and Saint Victor. The follow-

ing tables of analysis recently made by Mons. Willm, a distinguished chemist attached to the Laboratory of the School of Medicine at Paris, will show at a glance the composition of each of the sources, with their temperature and quantity. The result of another analysis of three springs made by Mons. A. Carnot, Director of the Laboratory of the School of Mines at Paris, so as to obtain the correct amount of arsenic contained in them will be seen in Table ii.

EUGENIE SPRING.

This spring is the largest, hottest, and most mineralised of the four springs; it throws up in huge bubbles 1,000 Litres (*Quarts*) of water per minute, and constitutes the main supply to the swimming and still baths, the steam for inhalation, the spray for aspiration, and the different douches.

This water is clear, gaseous, and odourless, or nearly so, the numerous glasses which are placed after drinking on the circular slab which surrounds the spring, are lined with incrustations

of the salts left after evaporation: this attests the large quantity of salts it contains. This water, from the large percentage of Lithia it contains, in combination with the soda and potash salts, is most valuable in all cases where gouty manifestations are present; it is easily borne by the stomach, and patients soon overcome the slight nauseating effect of its temperature; in fact almost all, after three or four days enjoy the drink, and find it soothing and pleasant, its high state of mineralisation—nearly 40 grains of solids in each litre, and its temperature 35·2° cent. = 96° Fah.—renders it a most valuable and agreeable water for bathing purposes, and has certainly contributed largely to give Royat its reputation as a Thermal Bathing Station.

CESAR SPRING.

This abundant spring, next to Eugenie in thermality, marks 25·5° cent. = 83° Fah. The large quantity lately discovered allows of its being used also for bathing purposes. This water is less

mineralised than the preceding; it contains a much larger amount of free carbonic acid gas, and is therefore one of the most appreciated waters for drinking, either alone at the spring, or at the table mixed with the country wine. It thus becomes a pleasant beverage, and will bear keeping in bottle for a considerable time without losing its properties. I have recently tasted some that had been in bottle for sixteen months (as an experiment) which I found still to contain some carbonic acid, and not at all unpleasant to drink. The amount of deposit was small.

SAINT MART SPRING.

This spring has been known for many years, and is mentioned by some of the old writers. It was lost for about forty years, having been covered up by an inundation in 1835. Twenty-seven years ago it was found again, and is at present in full play. Its mineralisation resembles somewhat that of Eugenie; its temperature differs, not exceeding 30° cent. = 86° Fah. It is

wrongly called an intermittent spring. The amount of water is the same, but it occasionally throws out large bubbles of carbonic acid gas, which last for a minute or two and then subside. This phenomenon is, no doubt, the result of accumulated gas in the upper part of the irregular channel through which it runs; the gas goes on collecting until the quantity becomes so great, that in order to find an escape, it forces itself through the column of water, thus causing this curious phenomenon.

This valuable water is very clear, rich in carbonic acid, which accounts for the perfect solubility of its various salts. It is largely used as a drink mixed with wine, and can be easily exported, keeping good for a long time. It is much frequented by persons who, though not under treatment, take an occasional glass, which sharpens their appetite, and prepares their stomach for an easy digestion.

SAINT VICTOR SPRING.

This spring constitutes one of the most valuable springs of this group of waters. The last analysis made by Mons. Willm, and repeated by Professor Carnot of the Paris School of Mines, shows that its temperature is 20° cent., or 68° Fah. It contains more salts of lime and potash than the other waters. It possesses also a larger percentage of iron, and contains 4½ *milligrammes* of arseniate of soda. It is enclosed in a well-constructed Roman grotto, with a flat roof formed by small stones and cement. One Roman column in a perfect state of preservation, seems to prove that they attached considerable importance to this spring. I shall draw particular attention to the value of this spring when treating of the diseases in which these waters are employed.

THE BATHING ESTABLISHMENT.

The baths, and all the other modes of applying the mineral waters, are enclosed in a building 80 metres long. The frontispiece which occupies the

centre of the building, has three wide entrances leading into the vestibule. In front, as you enter, is the office where you get your ticket for the different kinds of appliances, ordered by the physician: on either side of the vestibule are galleries, one to the right for ladies, the other on the left for gentlemen; each gallery containing 26 bath rooms, with baths made of marble, volvic stone, and enamelled iron. At the end of each gallery a special portion is arranged for the spray-producing machines, or pulverisers; and the carbonic acid gas bath and douches. A dressing-room is attached to this department. On each side of the vestibule a staircase leads up to the aspiratory rooms, where the patients sit in amphitheatre, and at different heights round a large tube, like the funnel of a steamer, out of which the mineralised steam is ejected in clouds. Another stair leads down to other galleries to the right. Another gallery with 26 baths, and hot douches. At the end of this there is a large swimming bath also of running mineral water called the *Piscine*. This large basin has the shape of a parallelogram presenting a surface of 130 square metres of thermal

water. The depth is graduated by an inclined plane, so that children can enter without fear. At the further extremity of this bath, the depth is about 6 feet, so that one can easily plunge and swim. In the centre over the water a gymnastic apparatus exists, which many patients use with pleasure and advantage. A swimming master is attached to this department which is open in the morning to ladies, and in the afternoon to gentlemen. On leaving the Piscine, you are supplied with a warm peignoir and towels before entering your rooms. On either side of this building is a hydropathic establishment, one for ladies, and another for gentlemen. These are well arranged, and afford ample means for using hot or cold water, separately or combined.

Two spacious and well-furnished ante rooms opening into the gallery on either side of the principal entrance are used by bathers who are waiting for the preparation of their bath, or getting cool before going out into the open air.

A smaller bathing establishment has been formed since the discovery of a large supply of water from the César spring; the temperature

being much less than the Eugenie, and highly charged with carbonic acid gas, renders it a most invigorating and delightful bath. A comfortable couch for the massage or kneading process is fitted up in a cabinet close at hand where the patient can be submitted to that treatment on leaving the bath. I cannot close this description of the establishment, without paying a due tribute of praise to the manager and his employés, who are most polite, very attentive, and particularly honest.

THERAPEUTICS.

The study of the chemical composition of the four mineral springs at Royat will show that we have several powerful agents at our command, and that much is available for the treatment of many morbid conditions, which resist the usual pharmaceutical applications we make use of in daily practice, and when it falls to our lot to see the extraordinary effect of these agents, properly managed, on many intractable cases, we are not

surprised to find so many people flocking every year to the health-giving springs. I shall therefore tabulate the most important maladies which are amenable to treatment by these mineral waters.

Gout, and its numerous manifestations, whether internal or external, are certainly benefited by the judicious use of these waters taken internally, as a drink, and externally in the still bath, or the swimming bath of running water; the latter, in cases of arthritis, I much prefer, as I consider the exercise taken in the act of swimming, or the movement the body is subjected to by walking about in warm mineral water, is a useful adjunct to the treatment: the stimulating effect on the entire skin produced by the large quantity of carbonic acid gas, is also an advantage of great value. The body, while immersed in these baths, gets covered with pearls or globules of gas which, after a short time burst, producing a slight tingling effect, leaving the surface of a rosy hue. This slight, and rather pleasant counter-irritation produced at the same time over the entire surface of the skin, must necessarily decongeitionise the

system. I believe that it is due to this that all invalids feel light, buoyant, and invigorated after the bath.

The immediate effect of this water taken internally, is to eliminate uric acid, either in a state of solution, or a crystallised state. Having examined the urine of all my gouty patients before, during, and after treatment, for uric acid, I find that the system gets thoroughly washed out. In several cases of frequent micturition, in which I suspected the accumulation of gravel to be the irritating cause, I found that in three or four days large quantities would be voided, and that immediate relief followed.

The second almost immediate effect noticed, is on the stomach, which, under the influence of the ferruginous and alkaline constituents, combined with a large amount of free carbonic acid gas, imparting to them a sharp taste, and sparkling appearance, relieves gastric irritation, corrects acidity and flatulency, and improves the tone of that organ. The result may be seen at the Table d'Hôte where many are seen devouring rather than eating their meals. At this point I must

warn all those who really wish to derive full benefit from the water cure, to avoid all the fatty and oily made-up dishes, as well as the sweets with which the French Tables d'Hôtes are generally covered, and which are too freely partaken of by the incautious invalid. Most of the French invalids drink large quantities of this strong alkaline water just before breakfast and dinner. They go in largely for rich sauces, oily salads, etc., which, by clogging up the secretory organs of the stomach, must render digestion most laborious, and by preventing the proper assimilation of food, naturally interferes with the nutrition of other organs.

RESPIRATORY FUNCTION.

One of the most distressing and not unfrequent symptoms which some gouty patients suffer from is dyspnœa. They generally complain of wheezing at night, which interferes with sleep, and is a source of great discomfort. This symptom ceases after a few days at Royat. Some men of experi-

ence pretend that it is owing to the carbonic acid gas which is being constantly evolved from the waters, and the surrounding ground. Others say it is to the peculiar equability of the temperature, and mildness of the climate. Others again attribute it to the effect of the waters. I fancy that there is some truth in all these assertions, and all contribute to the benefit derived. The stiff, swollen, and painful joints improve quickly under the influence of the prolonged warm bath, with massage, followed by a mineral-water poultice. This application which I adopted last year consists in wrapping up the joint in a piece of flannel well soaked in the warm mineral water (Eugenie spring) and covering it with a piece of gutta percha sheeting—spongio piline answers the purpose well. I saw one patient who, on arriving at Royat, could not walk for more than ten minutes without considerable pain. After his 25th bath, he walked six miles with the greatest ease. His feet and ankles were reduced in size, and were quite supple in their movements. Cases of bronchial catarrh, accompanied or not by asthma, also derive considerable benefit by the

aspiration of mineralised steam, these inhalations are carried out in a room in the shape of an amphitheatre, surrounded by benches placed in rows one above the other up to near the ceiling, in the centre of the room. A metal tube like the funnel of a steamer, rises above the ground for about seven or eight feet, throwing out clouds of mineralised steam; the patient sits down, inhaling from a quarter of an hour to an hour according as the case may be; and of course the higher he is placed, the more steam he gets; the patient during this process is deprived of his coat, waistcoat, and trousers, and is wrapped up in a flannel dressing gown. On leaving the inhaling room, he passes into an outer room warmed by steam or hot water, and there dresses slowly. Should there be any headache, the patient is ordered to take a hot foot bath for a few minutes before dressing. The inhalation followed by a hot bath is often most useful. From the establishment he goes home, either on foot or in a sedan chair, and rests for an hour until breakfast time.

Throat cases are treated locally by pulverised

mineral water. This is accomplished in a special room, surrounded by different kinds of silver plated pulverisers which are put in action by a force pump. The patient puts on an india rubber apron which fits round the neck, and hangs down the front of the body, protecting him from the spray. He then sits down opposite the apparatus and receives with open mouth the pulverised water. In another adjoining room, the neuralgic patient receives different sized douches of carbonic acid gas. A large bath for applying the gas on the whole surface of the body also exists, and I am told relieves neuralgia very considerably. I have not seen any cases which have undergone the general gas bath treatment, but I have seen a few who have had the gas douche applied locally for frontal neuralgia, with marked relief; in many cases the relief is almost instantaneous. Affections of the skin, or rather cutaneous manifestations proceeding from the gouty habit are cured almost with certainty by the general treatment at Royat. Among the most prominent are: eczema, acnea rosacea, herpes, sycosis, pityriasis, and psoriasis. Individuals who resist this treatment

are generally affected by scrofulous or specific taint. In these cases an after cure at Bourboule generally produces a marked effect. On looking over the analysis of the Saint Victor spring, one cannot fail to notice the large quantity of iron and arsenic in combination with other salts which this water contains, and which naturally carries our thoughts to the cases in which they can be applied with considerable advantage. Cases of anæmia, chlorosis, atonic dyspepsia, albuminuria, leucorrhœa, improve rapidly under the influence of this water. Pale, emaciated, stooping girls, evidently brought up in convents or schools, without proper food, fresh air, and out-of-door exercise, crowded at night into dormitories, without ventilation, are seen by dozens at Royat; the change which takes place under the influence of the ferro-arsenical water, combined with the exercise they take on the verdant hills surrounding the valley is very remarkable. All these waters are powerful medicinal agents; each has its special action, and it is only necessary to select proper cases for treatment, and to use a certain amount of sound judgement to obtain satisfactory results.

The hydropathic establishment affords ample means of applying hot and cold water, alternately, or combined in suitable cases for treatment. I have found in some exceptional cases where patients felt depressed, either by the thermal treatment, or from exposure to excessive heat, that the Scottish douche braces them up, and prepares them for their departure.

CLIMATE.

The position Royat occupies in a valley surrounded on all sides except the east, by mountains of various heights, its attitude above the sea level 1,480 feet, the luxurious vegetation which abounds on all sides, its particularly dry atmosphere and soil, with an equable warm temperature, is sufficient to impart even to the less cognisant with meteorology, a pretty correct idea of its climate, which can be summed up as temperate, dry, and bracing. This fact is of very great importance to those who are undergoing a water cure, for it

allows them to take any amount of exercise in the open air, without fear of taking cold, or exposing themselves to excessive heat, which is frequently the case in the cold elevated region of Mont Dore, or in the low hot plain of Vichy. The vegetation of Royat and its neighbourhood is very remarkable; it abounds in fruits of every description, and of a very superior quality. At Clermont large establishments for the manufacture of fruit pastes, especially the pâte d'Abricots, exist, and I am told that the produce of that article alone amounts to five millions of francs per annum. Cherries, peaches, and strawberries of great size and beauty abound, and roses are par excellence —the flower of Royat.

The Puy-de-Dome belongs to the Sub-Alpine Region, and is occasionally visited by clouds and thunder-storms, followed by copious rain. These *orages* come on generally at night, and seldom last more than two or three hours, sweeping away the clouds and leaving a clear sky and bright sun, with a cool atmosphere for the following day. It would be safe to select the following day after a storm for an excursion to the surrounding moun-

tains. Last year we had four storms during the season, all of which occurred at between nine and ten o'clock at night. Independently of the value of its thermal springs, Royat is one of the most pleasant places of resort for those who require a change. Among the numerous visitors who came last year to Royat, several distinguished physicians French and foreign were seen taking their holiday, and all seemed much pleased with everything they saw, and partook of. Few places can boast of so many advantages. The geologist, the botanist, the artist, the archeologist, and the general tourist will find ample means for study, pleasure, and exercise in this mountainous and volcanic region of Auvergne.

Ample means are provided for locomotion, and for those who cannot take long walks. Horses, carriages, ponies, and donkeys can be had at reasonable prices. Like all the principal watering places in France, Royat has its music in the park every afternoon, and an excellent casino for evening amusement. A good theatre, reading room, billiard and card room, and a restaurant. The hotels are good, and well served, and for those

who prefer it, a good selection of private villas, and cottages well furnished is to be had.

I cannot help mentioning some of the most favourite excursions worthy of a visit.

First to the town of Clermont Ferrand, where the visitors will find the cathedral; a fine specimen of Gothic architecture of the thirteenth and sixteenth centuries. Splendid specimens of old stained glass for which Clermont is still celebrated. Notre Dame du Port, one of the most beautiful types of Roman architecture in Auvergne. Close to the church is the Place Delille, where the first crusade was preached, 1095. Lecoq's public garden and museum are worth a visit. The latter contains a remarkable collection of botanical, geological, and ornithological specimens. Also a large library, and a collection of medals and coins, several remarkable pieces of antiquity of the age of stone, curious arms, and remains of the Roman temple dedicated to Mercury on the summit of the Puy-de-Dome.

The petrifying cave of St. Allyre is a curiosity worth a passing visit. Up the valley of Royat numerous excursions are available; the visitor,

however, should stop at Gravenair, Pepinière, Fontanas, the valley of Villars, and the Roman road, Boisejour and Beaumont.

At a greater distance, excursions on horseback or carriage to Gergonia, where Cæsar was defeated by the Gaul Vercingetorix. The quarries of Volvic, the old castle of Taurnvel, and the thermal springs of Chatel-Guyon. The Puy-de-Dome, which every traveller ought to visit from base to summit, is one of the most interesting mountains in France, standing erect in the midst of a series of extinct volcanoes, and at a height of 4,842 feet above the level of the sea, one enjoys from its summit one of the grandest panoramic views in Europe. The remains of a Roman temple dedicated to Mercury are very interesting. The observatory is also worthy of notice. From Royat the drive to the base (Col de Peyssat) takes about two hours and a half through a very lovely country; from the Col to the summit an hour's walk. Ladies who do not feel up to the walk can drive up in a kind of dog-cart drawn by two horses and a mule, but the walk is much preferable, as from the winding path which leads you to the top, a

variety of charming landscapes are continually unfolding themselves to the view. A word of caution to the visitor will be acceptable, before attempting the ascent, consult the barometer, and see that the Puy-de-Dome has his hat off. The Auvergnat gives this name to a black cloud, which hangs over the summit of the mountain, and which is a sure sign of rain. Anyone taking an interest in the scenery, and the beauties of Auvergne must read Herbert de Kautzow's charming little work "Summer Days in Auvergne."

Like most watering places, Royat has its three epochs during the season. The first begins as soon as the fine weather sets in, and therefore varies between the end of May and the 10th of June, ending on the 15th July. This season is generally less crowded than the second, which lasts from the fifteenth July, to the 25th August. This is called the fashionable season; it certainly is the warmest and the most crowded. The third and last begins on the 25th of August, and lasts until the weather begins to break, and cold sets in. It is not unfrequent to find fine weather lasting throughout the whole of September, and

those who are not pressed for time, will find it a most enjoyable month. As a rule, invalids who go for the third season remain as long as the weather allows them, not limiting their cure to a certain number of days. Those invalids who intend proceeding South to some winter resort would find advantage in coming to Royat during the last season, as they would not require to return to England; they would in fact find it an excellent climate of transition between England and the South of France or Italy.

Having given in the preceding pages an idea of the climateric conditions, and the value of the mineral waters of Royat, I do not think it out of place to add a few words in regard to this locality as a sanitarium for children, who either from hereditary disposition, or acquired tendency, to scrofula, are anæmic, dyspeptic, weak and stunted in their growth. Several very striking instances have presented themselves to my observation in which these symptoms were present, and in which a sojourn of two months at Royat proved highly beneficial.

Dr. Blatin, a distinguished physician and pro-

fessor at the medical school of Clermont, was kind enough to show me several cases of children, who had been for years in this condition, and whom I found strong and healthy. This physician has established at Clermont a gymnasium which he himself superintends, and which, under the proper guidance of an accomplished master, has several hundred pupils. The advantages obtained by a thorough methodical training have produced remarkable results, not only in developing the muscular frame of the healthy individual, but also in improving the health of weak and strumous children. I have no doubt that if children were, under proper guidance, submitted to a course of treatment by the Ferro-arsenical waters, the bracing and pure mountain air, good food, and a methodic course of gymnastics, great results would be obtained, not only by invigorating the healthy, but also by arresting disease, and changing the constitution of the sickly, and weak generation.

TABLE No. I.

Analysis of the Royat Waters by Ed. Willm, 1879.

Barometric Height, 728 millimetres.

	Eugenie.		Saint Mart.		Saint Victor.		Cesar.	
	Cent.	Fahr.	Cent.	Fahr.	Cent.	Fahr.	Cent.	Fahr.
Temperature	34·2	93·2	29·5	84·2	21·3	69·8	28·5	82·4
Free Carbonic Acid	1 grm., 3955		1 grm., 5524		1 grm., 7508		1 grm., 8188	
Silica	0·1026		0·0958		0·1050		0·0815	
Alumina	,,		0·0027		,,		,,	
Carbonate of Lime	0·7706		0·6172		0·7058		0·4540	
,, Magnesia	0·3497		0·4359		0·4519		0·2560	
,, Iron	0·0518		0·0141		0·0420		0·0340	
Arseniate of Iron	0·0008		0·0010		0·0021		0·0008	
Carbonate of Soda	0·7374		0·6611		0·6777		0·3371	
,, Potash	0·1423		0·1560		0·1564		0·0984	
,, Lithia	0·0322		0 0229		0·0246		0·0191	
Sulphate of Soda	0·1643		0·1482		0·1612		0·0893	
Chloride of Sodium	1·6728		1·5930		1·6479		0·6528	
Total ...	4·0297		3·7480		3·9746		2·0249	
In the Form of Bi-carbonates.								
Bi-carbonate of Lime	1·1183		0·8888		0·9164		0·6538	
,, Magnesia	0·4996		0·6226		0 6456		0·3657	
,, Iron	0·0740		0·0194		0·0580		0·0462	
,, Sodium	1·1687		0 0478		1·0732		0·5343	
,, Potassium	0·2070		0·2260		0·2269		0·1484	
,, Lithium	0·0592		0·0421		0·0453		0·0351	

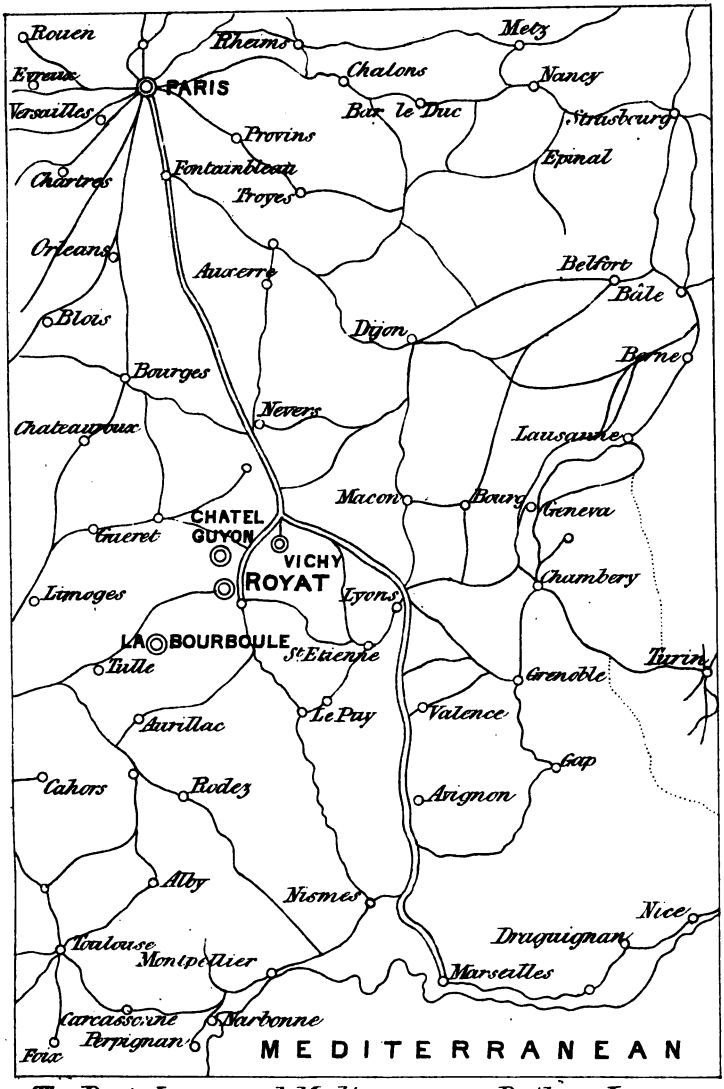
School of Mines, Essai Department.

TABLE No. II.

Research for Arsenic in the Mineral Waters of Royat.

	Saint Victor.	Cesar.	Saint Mart.
Arsenic	0·0011	0·0002	0·0004
or Arsenious Acid ...	0·0017	0·0003	0·0006
or Arseniate of Soda	0·00457	0·00083	0·00166

The Director of the Essai Department,
A. Carnot.



The Paris, Lyons and Mediterranean Railway Line.

Advertisements.

HOTELS AT ROYAT.

CONTINENTAL, SPLENDID, ROYAT, ANNEXE.

Kept by Madame Chahassière.

English and German spoken.

GRAND HOTEL.

Kept by Servant (Proprietor).

GRAND HOTEL DES BAINS AND HOTEL DE LA GRILLE.

Proprietor, Fournier Bathe.

HOTEL SAINT MART.
HOTEL DES SOURCES.
HOTEL DE PARIS.

VILLAS AND CHALETS.

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Warm, Mineral, Laxative Springs.

Situated in a small valley at about an hours drive from Riom, and Clermont Ferrand, is a small establishment lately formed for the convenience of the already numerous visitors who visit these springs. These waters owe their laxative properties to the large percentage of soda and magnesian salts, highly charged with carbonic acid gas. They are greatly recommended in cases of obstinate constipation, sluggish liver, and engorged intestinal organs, dyspepsia, gravel and obesity.

Clean establishment, good accommodation, warm climate and picturesque scenery.

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These celebrated springs contain more arsenic than any waters hitherto analysed. Situated in the centre of Old Auvergne at the junction of the Monts Dore and Monts Dome, at an altitude of 2,500 feet above the sea level, and surrounded by a most picturesque country. La Bourboule possesses a temperate and equable climate. These waters are highly recommended in cases of scrofula, lymphatism, skin diseases, consumption, and most chronic diseases in which a powerful tonic is required.

Good accommodation for invalids, and a first rate establishment with every appliance that science and practice can suggest.

The Bourboule Waters from the Perrière Spring

retain for a considerable time their medicinal properties, and are exported.

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